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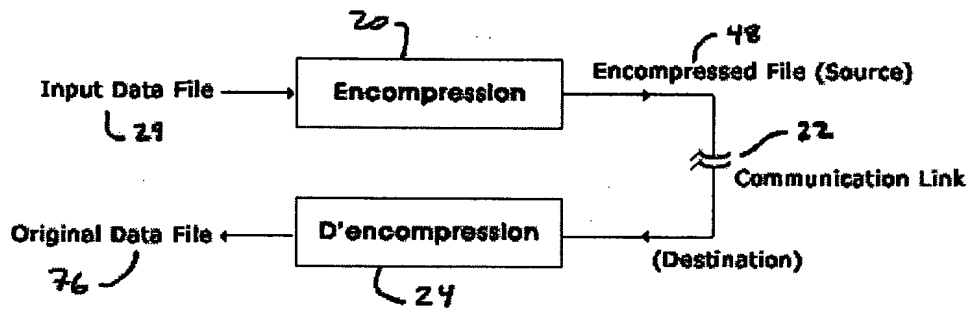
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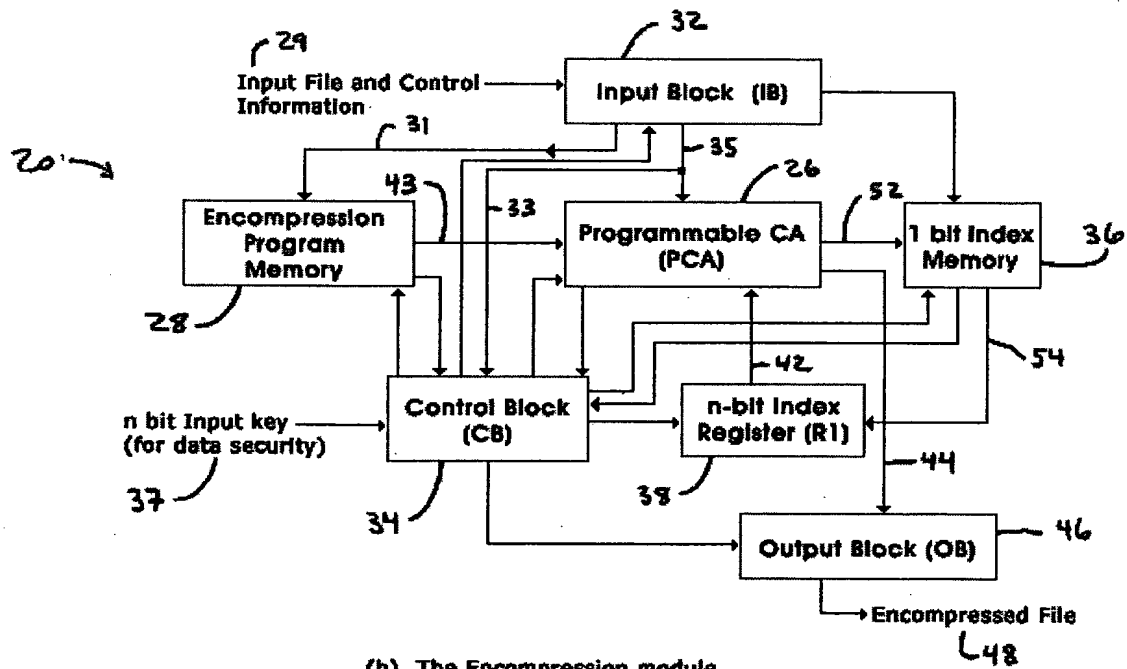
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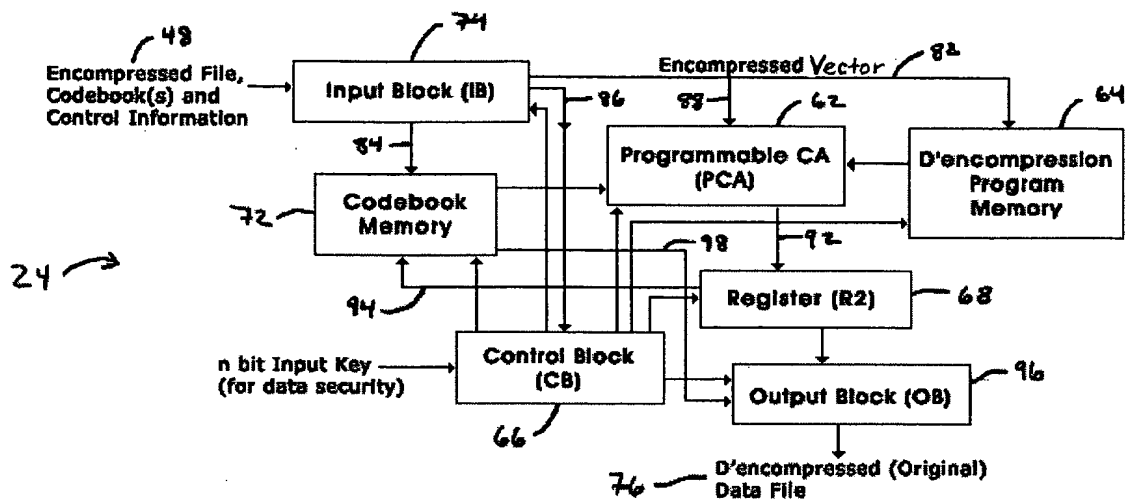
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(a) Encompression and D'encompression of Digital Data File



(b) The Encompression module



(c) The D'encompression module

Fig 1 The basic architecture and Encompression/D'encompression module

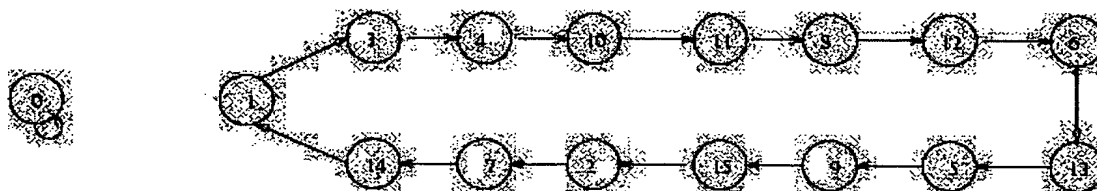


Fig. 2. State transition diagram of a maximum length group CA

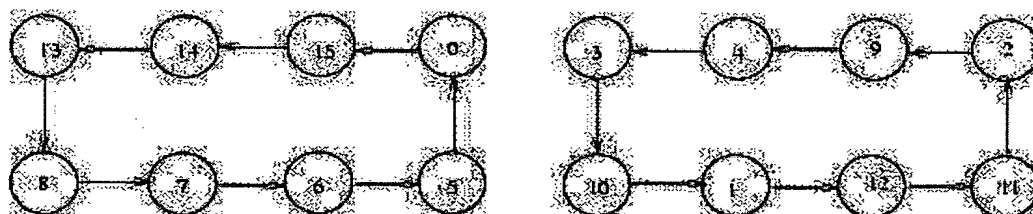
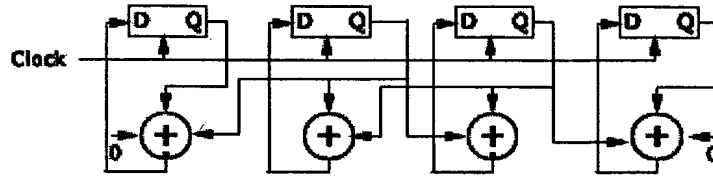
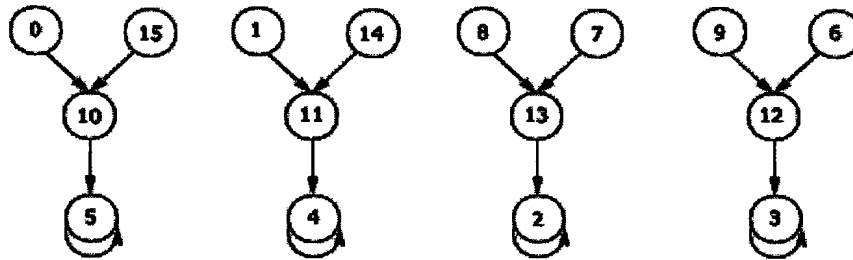


Fig. 3. State transition diagram of a non-maximum length group CA



(a) Structure



Zero-tree

$$T = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix} \quad F = \begin{bmatrix} 1 \\ 0 \\ 1 \\ 0 \end{bmatrix} \quad \begin{array}{l} n = 4 \\ \text{Nonreachable states} = 0, 15, 1, 14, 8, 7, 9, 6 \\ \text{Attractors} = 2, 3, 4, 5 \end{array}$$

(b) T matrix, F -Vector and State-Transition Diagram

**Fig. 4. Structure and Behavior of a Four-Cell non-group CA
(also referred to as Multiple Attractor CA (MACA))**

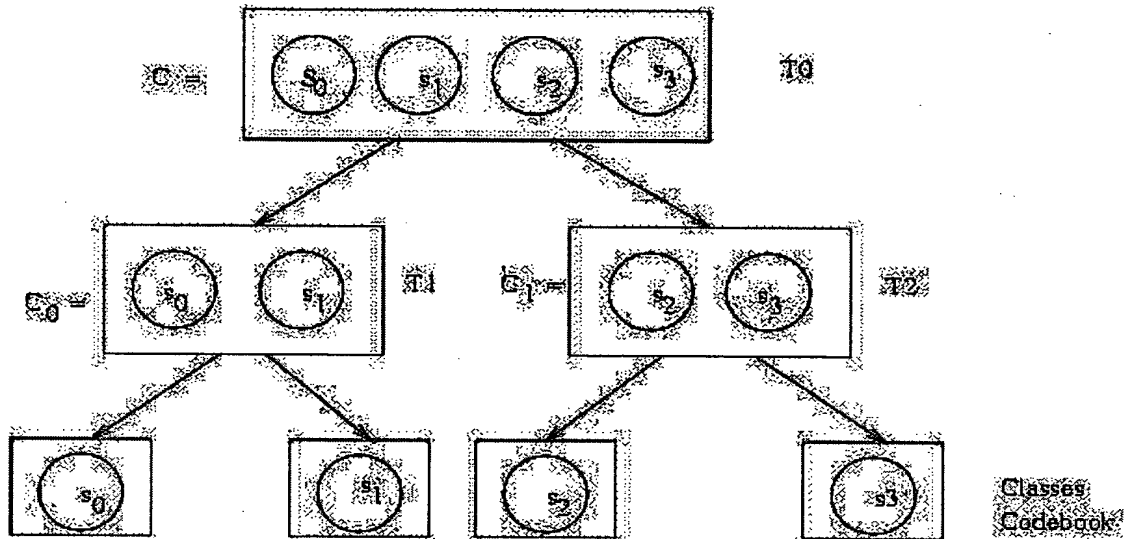


Fig. 5. The logical Structure of multi-class Classifier designed with multi-stage two-class classifiers

Note: (i) Each classifier is a MACA having the states of one subset of attractor basins belonging to one class while that of the other subset covers the elements of the second class.
(ii) The PEF (Pseudo Exhaustive Field) field of attractor is used as the address to access 1 bit Index Memory (36 in Fig 1 (b)) that stores 1 bit (0 or 1) class information of two-class classification.

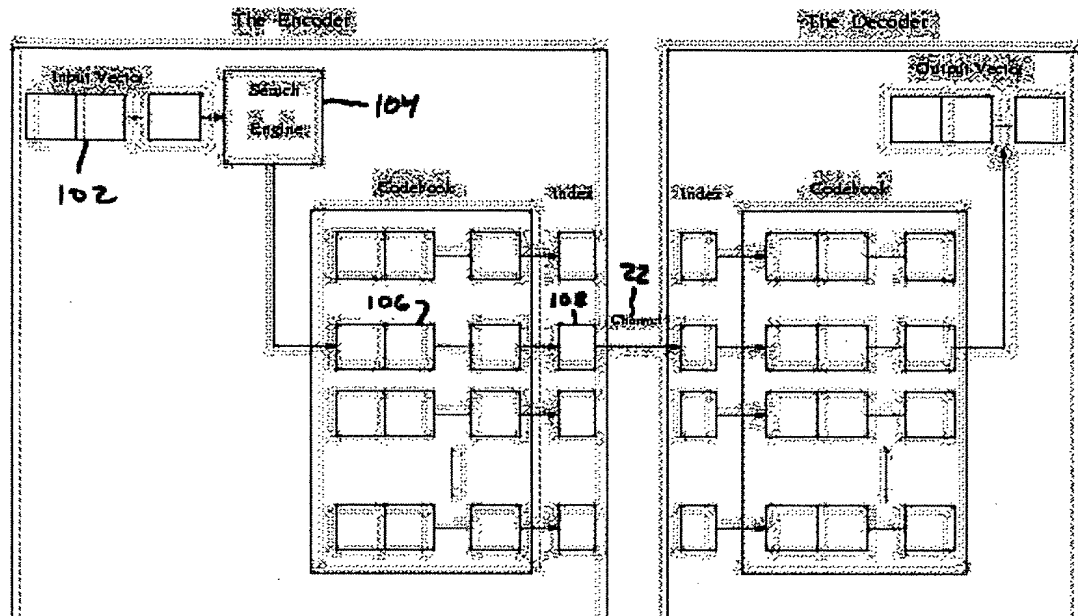


Fig. 6. Encoder and Decoder

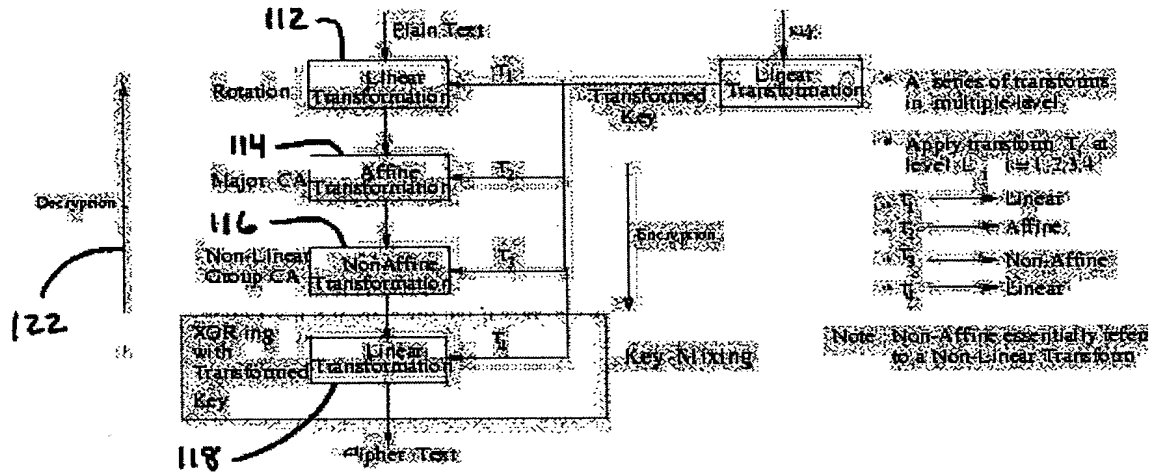


Fig. 7. Block Diagram of Encryption Scheme integrated in the Encompression Algorithm